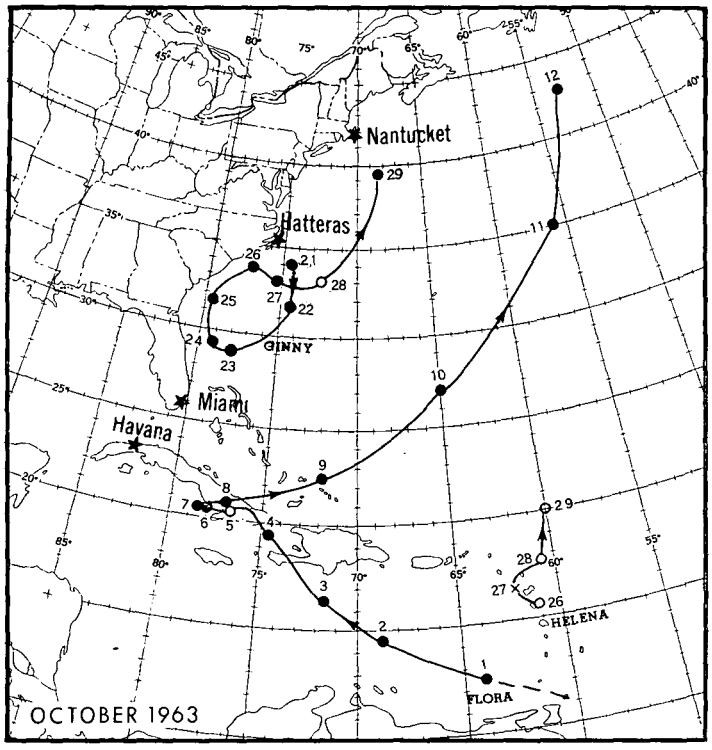

FIGURE 10.—Preliminary tracks of Atlantic hurricanes and tropical cyclones during October 1963. Circles and dates indicate 1000 GMT positions. Solid circles denote hurricane intensity and open circles tropical storm intensity. Helena was a tropical depression on the 27th. The paths of Flora and Ginny were extremely unusual.

strong. The long fetch of easterly anomalous flow along the northern edge of the Tropics and subnormal heights within the Tropics west of 180° long. constituted a favorable climate for the rather frequent occurrence of typhoons (see fig. 9), most of which followed typical paths, curving northward around the western end of the subtropical High from a deep mean trough.

5. ATLANTIC HURRICANES

Three tropical storms were observed in the Atlantic during October, tracks of which are shown in figure 10. Of the three, Flora and Ginny reached hurricane intensity. Flora was unusually destructive. In fact, Flora took more lives (6792 by latest estimate) than any previously recorded tropical cyclone in the Atlantic area, including the historic Galveston hurricane of 1900. The storm reached its maximum intensity just before crossing Haiti (fig. 10) where it caused flash floods and landslides which washed away or buried portions of towns, and cost an estimated 5000 lives. The highest measured wind on Haiti was 120 m.p.h. In Cuba, where 1750 lives are believed lost, winds of 70 to 100 m.p.h. lashed eastern sections for 100 or more hours. In a 12-hr. period on October 3–4, 16 in. of rain fell at Morne Macaya, Haiti. The storm total at Silver Hill, Jamaica was more than 60 in.

A conservative estimate of property damage attributable to Flora is $488,550,000, with some areas of Hispaniola still to be heard from. Damage to the economy of the areas worst hit is more difficult to estimate but the effects of Flora will surely be felt for years.

Hurricane Flora originated in the Tropics and remained imbedded in the tropical easterly flow for several days until it became blocked near eastern Cuba by high pressure areas to the west, north, and east. After spending nearly 5 days in the vicinity of eastern Cuba, it was picked up by westerlies in a polar trough and carried northeastward into the Atlantic.

Hurricane Ginny formed in the cut-off southern section of a shearing mean trough. The storm began as a cold Low and gradually assumed tropical characteristics over warm waters of the Gulf Stream at about 34° N. This storm was forced southwestward (fig. 10) by a strong ridge moving eastward over New England and the Maritime Provinces (fig. 8B). The positive height anomaly center in the ridge shifted rapidly to Davis Strait near the end of the month and Ginny then moved swiftly northeastward. The storm grazed New England on the 29th with gusts up to 76 m.p.h. at Nantucket, Mass., and some wind damage at Portland, Maine. While there were also reports of beach erosion, hurricane Ginny was undoubtedly more beneficial than destructive, since rainfall from the storm along the coasts of the Carolinas and New England ended long dry spells in both areas.

REFERENCES

1. W. H. Klein, "Specification of Monthly Mean Surface Temperatures From 700-mb. Heights," *Journal of Applied Meteorology*, vol. 1, No. 2, June 1962, pp. 154–156.
2. J. F. O'Connor, "The Weather and Circulation of July, August, and September 1963—Dry and Cool in the East," *Monthly Weather Review*, vol. 91, Nos. 10–12, Oct.-Dec. 1963, pp. 737–748.
3. U.S. Weather Bureau, *Weekly Weather and Crop Bulletin, National Summary*, vol. L, Nos. 43, 44, 46, Oct. 28, Nov. 4, and Nov. 18, 1963.
4. J. Namias, "Factors in the Initiation, Perpetuation, and Termination of Drought," *Proceedings* of Commission of Surface Waters, General Assemby, IUGG, Helsinki, 1960, Association of Scientific Hydrology Publication No. 51, 1960, pp. 81–94.

Revision of Monthly Temperature Charts On Back of *Daily Weather Map*

The charts entitled "Average Daily Maximum Temperature," "Average Daily Minimum Temperature," "Average Daily Temperature," and "Average Daily Range of Temperature" which have appeared each month on the back of the *Daily Weather Map* for over 15 years are being revised. The new charts are based on the 30-year normals, 1931–60, and will be entitled "Normal Daily Maximum Temperature," etc. It is recommended that the old charts be discarded as the new ones become available.

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